

Summary of the publication:

Alveolar Ridge Preservation – Preserving and Building up the Bone Structures after Extraction

Field study of DGZI

Hille R, *Implantologie Journal* 1/2005:12-18

Purpose:

It is well-known that the alveolar bone collapses after extraction. Without bone preservation measures, the resorption of the alveolar bone is 40–60% within the first 2–3 years.

The main objective of the study was to evaluate possible differences in the resorption of the alveolar bone after the extraction of teeth while simultaneously initiating measures for building up and preserving the bony structures and to compare the results with studies described in the literature concerning bone resorption and alveolar collapse.

Materials and Methods:

In this prospective survey, nine private practices of the DGZI “Alveolar Ridge Preservation” study group participated. The teeth had to be extracted as gently as possible, generally with periostomes and elevators. The granulation tissues in the alveolus had to be removed gently by curettage and rose-head burr and the residual bone in the alveolus refined. Cerasorb® (synthetic, pure-phase β -TCP; Curasan AG) having a granule size of 500–1000 and/or 1000–2000 μ m, was used as bone graft material and was mixed with fresh blood from the defects before the application into the alveolus.

Compared to materials of biological origin (human, animal) no potential immunological and infection risks are to be expected. Two types of membranes were used in this study: When the defects could be closed with the soft tissues until a maximum opening of only 4 mm was left, resorbable membranes were used (Epi-Guide®). On the other hand, when the residual openings were more than 4 mm, non-resorbable membranes were used (TefGen). After 1–2 weeks, an examination of the clinical findings was conducted. The non-resorbable membranes were to be removed after 4 to 6 weeks. Standardized x-rays were taken after 3, 6 and if required, 12 months for evaluating the progress of bone regeneration and determining the exact schedule for inserting the implant.

Results:

80 patients (41 female, 39 male) in the age of 26–81 years (mean age 54 years) were available for the evaluation. In total, 97 teeth were removed, in 80% (64 cases) because of marginal and apical periodontitis. The lower ($n=36$) and upper molars ($n=16$) were extracted in most cases. On an average, 0.78 g Cerasorb® was used per patient. In 53 cases non-resorbable Tef-Gen membranes and in 20 cases resorbable Epi-Guide® membranes were used. In 53 patients (66%) an antibiotic

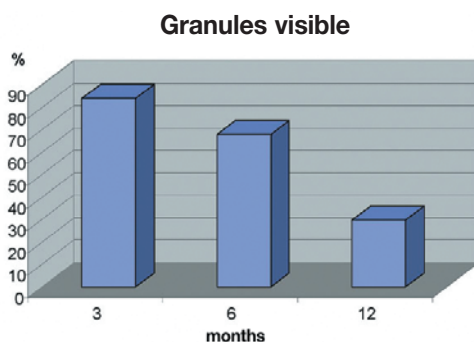


Fig. 1: Resorption of the bone augmentation materials as seen in the x-rays after 3, 6 and 12 months. Clear reduction after 12 months. Granules visible only in approx. 30% of the patients

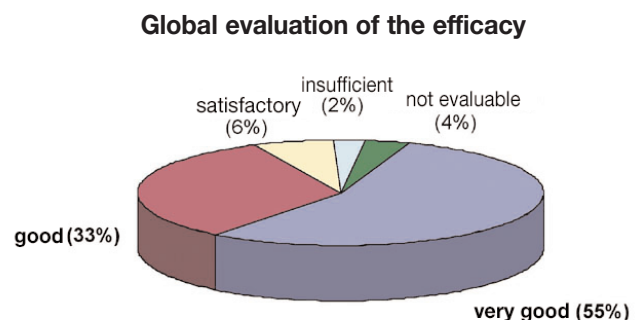


Fig. 2: Global evaluation of the efficacy at the last point of observation

medication was required. In the clinical check one to two weeks after the treatment, the healing of the soft tissues was very good to good in 87 % of the cases. The average retention period of the membranes was 4.2 weeks. Effects such as redness, swelling, inflammation and dehiscence were observed after 3 months in some patients. These patients continued the treatment, and after 12 months these effects had disappeared totally. After 12 months, granules were found in the x-rays in less than 30 % of the cases (Fig. 1). The coronal-apical bone resorption as well as the bucco-lingual bone loss after 12 months was less than 10 % in most cases. The success of the therapeutical measures and the tolerability of the procedures and materials used were evaluated on the last day of the observation period of the patient concerned. In 88 % of the cases, the efficacy was assessed as very good to good on the basis of the bone regeneration due to augmentation with Cerasorb® (Fig. 2). In 89 % of the cases, the tolerability was assessed good to very good. There were no complications such as allergic reactions, problems in wound healing or pain etc.

The non-resorbable TefGen membrane was assessed in the global assessment at the end of the observation period as very good and good in 83 % of the cases regarding the effectiveness and with good to very good in 85 % of the cases regarding tolerability. The resorbable Epi-Guide® membrane was evaluated as very good and good in 90 % of the cases regarding the effectiveness and in 70 % of the cases regarding tolerability.

Discussion

In the dental practice, the demand for dental implants is constantly increasing. Insufficient bone structures may prevent an implantation in many cases, since expensive and difficult bone regeneration measures are essential. The day-to-day experience in implant dentistry shows that the augmentation of alveolar defects at the time of extraction can avoid the loss of the alveolar crest. The results of this study are continuously indicating that, following an augmentation with the synthetic β -TCP bone regeneration material Cerasorb® and covering with an appropriate membrane, the bone loss in most cases is less than 10 % and less than 20 % in 90–100 % of the cases. These figures confirm the advantages of the described augmentation procedure. The residual granules that are still visible in about 30 % of the cases during the final x-ray documentation do not affect the clinical findings and stability in any way.

Conclusion

The resorption of the alveolar bone after extraction of teeth can be reduced considerably by simultaneous augmentation of the alveoli with Cerasorb® and the use of non-resorbable (TefGen) or resorbable (Epi-Guide®) membranes as barriers over the extraction alveolus. The tolerability of the described procedures and materials is clinically evaluated as good to very good. Thus, this method can be recommended if a maximum preservation of the alveolar bone is essential, particularly for implant borne prosthetic reconstructions or because of aesthetic reasons.

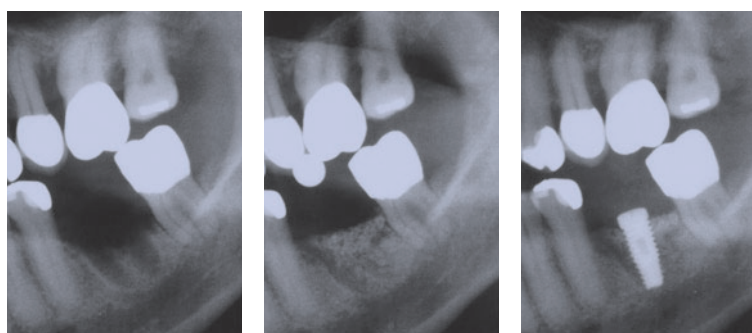


Fig. 3a: 66 year old female patient, situation after extraction of tooth 36 due to periodontitis and peri-radicular osteolysis, subsequent augmentation with Cerasorb® and closing with TefGen membrane.

Fig. 3b: Check after 4 months – granules visible

Fig. 3c: Situation after inserting an implant in the regenerated bone 5 months post-OP, granules no longer visible.

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